

## **REMARKS**

### **Status of the Claims**

Claims 1-4, 7-19 and 30-44 are pending herein. Claims 1-3 are rejected. Claims 4, 7-19 and 30-44 are allowed.

### **Claim Rejection under 35 USC § 103(a) over Chang**

Claims 1-3 are rejected under 35 USC §103(a) as being unpatentable over Chang et al., U.S. Patent No. 6,805,952 ("Chang"). Applicant respectfully traverses this rejection.

As indicated in the prior Office Action, Chang teaches at col. 3, lines 48-50 that the reactor components of his invention can be made from "metallic materials or ceramic materials". The only species within this genus that is identified in Chang is aluminum.

The Office has recognized that Chang fails to teach that the metal is a zirconium alloy, but has argued that to "[t]o select a species of the genus disclosed by Chang would have been obvious to one having ordinary skill in the art, in order to impart erosion resistance thereto." Applicant respectfully disagrees.

For a proper obviousness rejection, the differences between the subject matter sought to be patented and the prior art must be such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. 35 U.S.C. §103. The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. MPEP 2141. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." MPEP 706.02(j), citing *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, 82 USPQ2d 1385 (2007), quoting *In re Kahn*, 441 F.3d 977, 988, (Fed. Cir. 2006). In addition, there must be a reasonable expectation of success. See MPEP 2143.02.

Here, the genus referred to by the Examiner in Chang is “metallic materials.” It is believed that the disclosure of this vast genus, coupled with the disclosure of only a single species (i.e., aluminum) could not possibly render obvious a zirconium alloy support as set forth in claim 1, because there would be no reason for one of ordinary skill in the art to resort to such a substrate in light of the teachings of Chang as required by 35 U.S.C. §103.

The Examiner has responded to the above-noted arguments in the following manner:

Applicant is merely claiming any alloy containing Zr. Chang broadly teaches that metallic substrates, such as those including Al, may be employed. Moreover, Chang contemplates use of Zr containing substrates by disclosure of zirconia. Given the breadth of the present claims, it is the Examiner's position that it would have been obvious to one having ordinary skill in the art to employ a metal alloy containing Zr, as presently claimed. Such alloys containing Al and Zr, for instance, are old and well known in the art. Applicant is claiming no specifics with respect to the metallic substrate, only that it comprise Zr.

Although Applicant does not dispute the existence of zirconium alloys, the fact remains, however, that Chang does not teach or suggest such a material. Rather, as indicated above, Chang discloses only that “[s]uitable metallic materials include aluminum.”

Moreover, claims 1-3 are directed to an erosion-resistant article comprising (a) a *zirconium alloy support* and (b) an *oxide coating comprising yttrium* disposed over the support, wherein the support and said oxide coating have material compositions that differ from one another in coefficient of thermal expansion by no more than a maximum claimed amount (i.e.,  $5 \times 10^{-6}/K$ ,  $3 \times 10^{-6}/K$  or  $1 \times 10^{-6}/K$ ).

Chang, on the other hand, teaches that where it is desired to minimize or eliminate differences in the coefficients of thermal expansion (CTE) between the coating and component, *the same material* can be used for the both the component and the coating. See col. 5, lines 25-33. Thus, for this additional reason, Chang does not teach or suggest the invention of claims 1-3.

For at least the preceding reasons, reconsideration and withdrawal of the rejection of claims 1-3 under 35 U.S.C. §103 are respectfully requested.

## **CONCLUSION**

Applicants therefore submit that the claims of the present invention are in condition for allowance, early notification of which is earnestly solicited.

The Office is authorized to charge any fees required to deposit account number 50-1047.

Respectfully submitted,

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